



DATE: July 26, 1984
TO: Division Subpart F File
FROM: Dale A. Helmers
SUBJECT: 11911501 -- Madison County
Wood River/Amoco

On July 23, 1984 a meeting was held to discuss the groundwater monitoring programs at the above referenced facility. Present at the meeting were Dick Sumner, Gene Schmidt, Ray Vaseleski and Ed Sullivan for Amoco, and Mark Haney and Dale Helmers representing the Agency.

The meeting opened with a brief discussion of the delegation of authority for Amoco's Wood River facility. Amoco's Wood River facility is presently owned by Amoco Oil Company. Amoco Oil also operated the facility until late 1981. The present situation has Amoco Chemical operating the facility, but Amoco Oil retains the responsibility for the Subpart F areas. The on-site liaison is Mr. Sumner of Amoco Chemical. If the Agency feels that someone from Amoco Oil should be present for any inspections, etc., Mr. Sumner will make the necessary arrangements.

Following the preliminary discussion, the issues raised by the May 24 and May 30, 1984 CIL's were resolved as follows:

725.190(a) and 725.191 - Main Plant Site.

According to Mr. Schmidt of Amoco, the present monitoring system at the main plant site was designed to monitor the regional groundwater flow. This system was primarily structured to detect movement of contamination off of Amoco's property. It neglected the affect of the pumping at the on-site wells. After hearing the Agency's concerns about this monitoring strategy, Amoco agreed to implement a new program to monitor the uppermost aquifer. The new system will consist of 4 downgradient and 3 upgradient wells. The 4 downgradient wells will be evenly spaced along the north boundary of the waste management area. The distance between the wells will be 250 feet or less. The 3 upgradient wells will be located to the south, southwest and southeast of the regulated unit. Amoco will have these new wells installed, developed and the first quarterly background samples taken by September 1, 1984.

Amoco also agreed to conduct a hydrogeologic study to determine the presence and affect of any perched water tables. The study and proposed monitoring plan will be submitted by November 1, 1984. Following Agency comment and approval, the shallow monitoring program will be implemented. The implementation date will be no later than January 1, 1985.

EPA Region 5 Records Ctr.



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725.190(a) and 725.191 - Riverfront Site.

Amoco's second area which is subject to Subpart F is the riverfront impoundments. These impoundments are commonly referred to as Ponds 1-4. The present system was designed to monitor ponds 1 and 2 only. Amoco agreed to install a new monitoring system which will consist of 2 upgradient and 8 downgradient wells. The upgradient wells will include P-5 and a new well to be located somewhere along the north or west sides near P-5. The location will be finalized by Amoco, but will be situated to minimize the affect of past disposal areas. This may require that the new well be subject to some limited flooding. The downgradient wells will be evenly spaced along the northeastern side of the impoundments. The distance between the wells will be 250 feet or less. The wells will be installed, developed and sampled by September 1, 1984.

Amoco will also conduct a hydrogeologic study on any perched zones present on the riverfront property. This study will be completed and a shallow monitoring program proposed by November 1, 1984. Following Agency comment and approval, the shallow system will be implemented. This will take place no later than January 1, 1985.

725.192(d).

Amoco will sample and analyze the wells quarterly for one year. The background data will be completed by September 1, 1985.

725.193(f).

Amoco presented a map of the piezeometric surface of the uppermost aquifer. This map will be included in their groundwater monitoring plan. A similar map for the perched zones will be included upon completion of the hydrogeologic studies.

725.194(a)(2)(A).

Since the date of this inspection, Amoco has changed their reporting format so as to indicate any parameters whose value exceeds the maximum contaminant levels.

725.194(a)(2)(B) and 725.194(a)(2)(C).

Amoco's annual reports will meet these requirements (only the 1982 report was inadequate).

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The following information will be incorporated into the groundwater monitoring plan:

1. a regional hydrogeologic map;
2. a potentiometric map with groundwater flow lines;
3. new sample collection procedures (Mr. Sumner will confer with Ms. Dilday of the Southern Region); and
4. a map delineating the waste management area and areas of recharge and discharge.

It was also agreed that:

1. all new wells will be installed under the direction of a hydrogeologist;
2. information on well development will be included on the boring logs or well construction diagrams; and
3. additional hydrogeologic information on the uppermost aquifer will be obtained. This will include a minimum of 2 slug tests.

Two other potentially regulated units were also discussed. Amoco stated that the pit near Tank #246 contained only non-hazardous waste. Thus, it was not a regulated unit. The sludge pits located north of Tank #233 were included in Amoco's Part A. Amoco will get a ruling from USEPA to determine if the pits are considered a regulated unit. If the pits are found to be subject to the regulations, a Subpart F program will be implemented. Amoco will keep the Agency informed on its discussions with USEPA.

Well construction requirements were also discussed. The Agency asked that the wells be screened in the uppermost portion of the uppermost aquifer. If the aquifer is not completely saturated, the well will be screened 5 feet below and 5 feet above the water table in the aquifer. If the aquifer is completely saturated, the wells will be screened just below the shallow clay layer. In no case will the screened interval exceed 10 feet in length. All wells will be constructed of the same material and the same screen slot size will be used in all wells.

Amoco will send a letter to confirm its interpretation of our agreements. The letter will answer all points raised in the CIL's.

DAH:tk/11-13

cc: Region
Working File
Mark Haney

JULY 23, 1984 AMOCO MEETING

Dale Helmers	IEPA - Compliance
Mark Haney	IEPA - Compliance
Dick Sumner	Amoco Petroleum Additives - Wood River, IL
Gene W. Schmidt	Standard Oil - Tulsa, Oklahoma
Ray C. Vaseleski	Amoco Chemicals - Chicago, Illinois
Ed Sullivan	Amoco Oil Company - Chicago, Illinois

DAH:tk/14

REMARKS

Use this section to briefly describe site activities observed at the time of the inspection. Note any possible violations of Interim Status Standards.

On August 6, 1984, an inspection was conducted at Amoco Oil's Riverfront property by Pat McCarthy and myself. Ed Sullivan and Dick Sumner accompanied us representing Amoco. The riverfront property consists of four surface impoundments and one landfill. The four impoundments contain DAF Float from the refinery, which closed down in 1981. Amoco is currently pursuing delisting the "Chemfixed" DAF sludge material. During our inspection, Pond #5, an area not regulated, was being dredged. This activity is to prepare this area for the final disposal of the Chemfixed DAF, if it is delisted. Also, re-shaping of the dikes of Pond 1-4 was being done and Pond 3 water was being pumped to the WWTP for treatment.

Another area was observed, this is the past disposal area, where final cover cap and a bentonite slurry wall were emplaced in 1981. This constitutes significant management activities and subjects the landfill to the RCRA requirements. Apparent violations of the riverfront property are all a result of this disposal area not being regulated by Amoco. The landfill checklist (page 14) of this inspection report was not completed, because it generally does not reflect this specific situation. The violations noted this date are as follows:

Subpart H - Financial Requirements

Subpart N - Landfills
Section 725.410

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IEPA-DLPC



11911501 Madison County
Wood River / Amoco - Riverfront

Amoco Oil Company

200 East Randolph Drive
P.O. Box 6110A
Chicago, Illinois 60680

September 19, 1984

Certified Mail P16 2199301
Return Receipt Requested

Mr. Mark A. Haney
Manager, Groundwater Compliance Sub-Unit, DLPC
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, IL 62706

Dear Mr. Haney:

Groundwater Monitoring Deficiencies at Amoco Riverfront Property,
ILD 980503106

As a result of the Compliance Inquiry Letter received by Amoco on May 30, 1984, we are responding to the deficiencies and alleged violations of Title 35: Illinois Administrative Code, Subtitle G, Subpart F, Groundwater Monitoring. The deficiencies and allegations were reviewed on a point-by-point basis in the meeting of July 23, 1984 attended by you and Dale Helmers from IEPA with R. A. Sumner, R. C. Vaseleski, and E. J. Sullivan representing Amoco. The following narrative outlines the compliance program proposed by Amoco and agreed to by all parties at the July 23, 1984 meeting.

In order to meet the Class I compliance requirements, it was agreed that additional monitoring wells would be installed on the riverfront area. The installation of two upgradient and eight downgradient wells in the uppermost aquifer was completed August 27, 1984. The ten wells are shown on Figure 1.

To further fulfill the Class I requirements, a geohydrologic subsurface investigation is being conducted by Amoco's Groundwater Management section to develop recommendations to be made to IEPA for a program of monitoring wells for the upper groundwater table. This study will assist in characterizing the upper groundwater table as well as address level fluctuation, local water pumpage, and river stage fluctuations. Initial recommendations will be submitted to IEPA by October 1, 1984. Assuming IEPA approves the recommendations for the upper groundwater table monitoring wells by October 15, 1984, these wells will be installed by January 1, 1985 by Amoco's Groundwater Management Section.

The construction and installation of all monitoring wells was supervised by a qualified geologist from Amoco's Groundwater Management Section. After completion of construction, the wells were developed by air jetting.

The Class III violations listed were previously addressed in correspondence between Amoco and IEPA dated May 10, 1983, July 19, 1983, and March 13, 1984. Please also note that as a result of the aforementioned July 23, 1984

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Mr. Mark A. Haney

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meeting, it was agreed that the data from the June, 1984 sampling will not be compared to the previous four quarters and statistically evaluated for significant deterioration.

Per the IEPA inspection, the groundwater monitoring plan was deemed insufficient in several areas. The groundwater monitoring plan is being revised to include a regional hydrogeologic map showing recharge and discharge areas, generalized groundwater flow lines, and delineation of waste management areas. The groundwater monitoring plan will also be revised to more clearly state field procedures and provide provisions to prevent cross-contamination between wells. The plan will be completed by November 1, 1984.

If there are further questions regarding groundwater monitoring, please contact E. J. Sullivan in Chicago at (312) 856-5858 or R. A. Sumner in Wood River at (618) 251-2228.

Yours truly,



J. G. Huddle
Director, Environmental Control
and Planning
Mail Code 1203

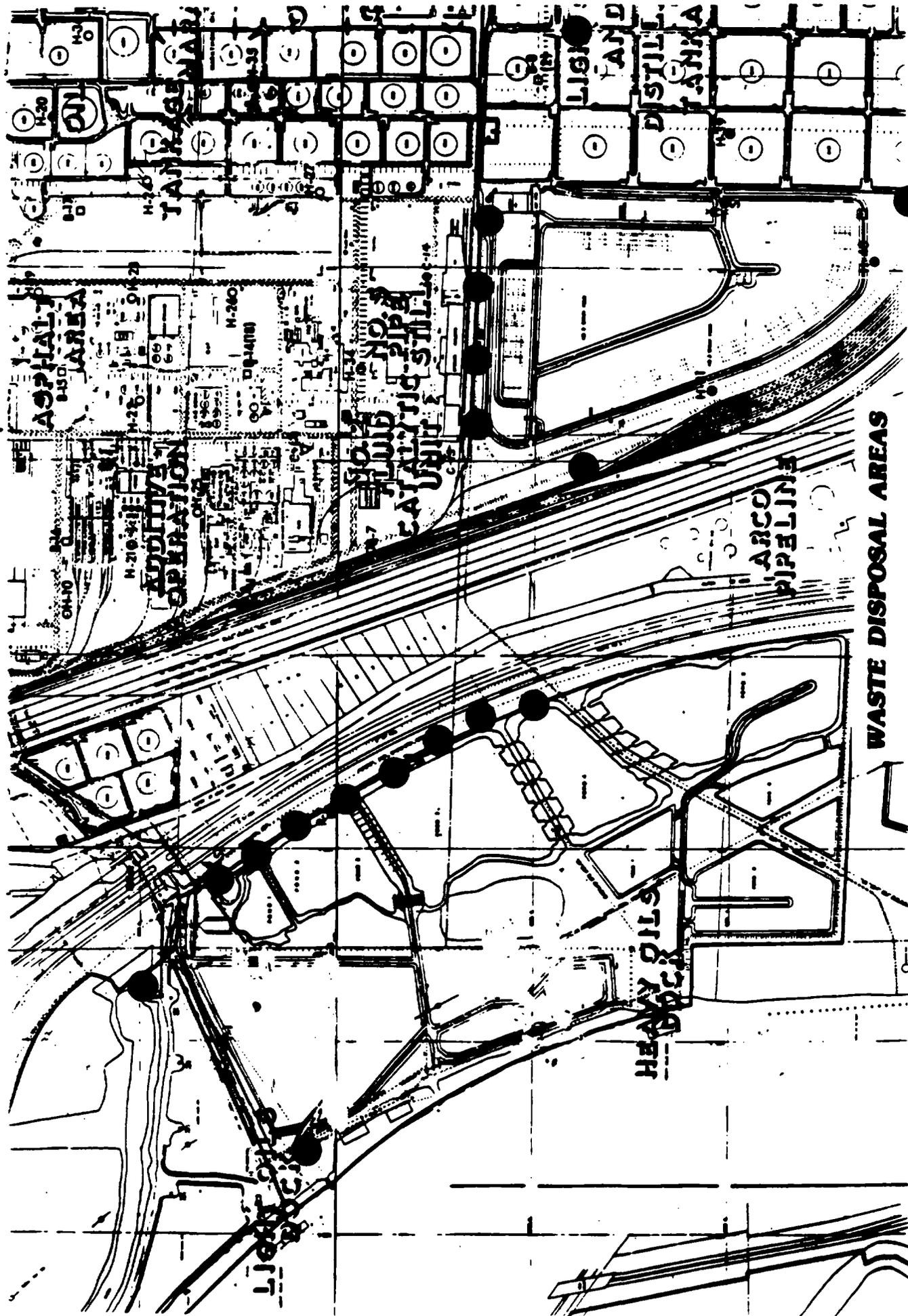
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Attachment

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Gene W. Schmidt
7-27-84

WOOD RIVER, ILLINOIS

FIGURE I

● **PROPOSED MONITORING WELLS**
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Dr. File

217/782-6761

Refer to: 1191150006 -- Madison County
Wood River/Amoco-Riverfront
Wood River/Amoco-Main Plant
Subpart F, Groundwater Monitoring

January 4, 1985

CERTIFIED # P731918063

Amoco Chemicals Corporation
Mail Code 1203
Post Office Box 6110-A
Chicago, Illinois 60680

Attention: Mr. E. J. Sullivan
Environmental Consultant

Dear Mr. Sullivan:

This letter is in response to Amoco's revised groundwater monitoring program dated December 14, 1984 for its Wood River facilities, and your telephone conversation with Kenneth Liss of this Agency on January 2, 1985.

After reviewing Amoco's revised plan incorporating the Agency's recommendations, it appears that the groundwater monitoring program for the upper groundwater table conforms with the regulatory requirements of Section 725.191 of the Illinois Administrative Code, Title 35, Subtitle G. However, the compliance inquiry letter of November 28, 1984 cannot be resolved until the following points are addressed.

1. During your telephone conversation with Mr. Liss, you indicated wells RP-8S and RL-6S were installed on December 28, 1984. The boring logs and construction diagrams for these wells must be submitted to this office.
2. A minimum of three slug tests are required in the riverfront area and two in the spray pond area. These tests should be performed and the evaluated results submitted to this office.

You are requested to submit to this office, no later than January 31, 1985, the information stated above. Your response should be directed to:

Page 2.

Illinois Environmental Protection Agency
Division of Land Pollution Control #24
2200 Churchill Road
Springfield, Illinois 62706

Attention: Mark A. Haney, Manager
Facilities Compliance Unit

If you have any questions, please feel free to contact Kenneth W. Liss
of my staff at 217/782-6761.

Sincerely,



Mark A. Haney, Manager
Facilities Compliance Unit
Compliance Monitoring Section
Division of Land Pollution Control

MAH:KWL:tk/20

cc: Division Subpart F File
Southern Region
Kenn Liss
Compliance Correspondence Log (A)



Standard Oil Company (Indiana)
Naperville, IL 60566

E. J. Sullivan
Amoco Oil Company
Chicago, MC1203

Wood River "Pond 5" Sludge Composites

We have completed the analysis of the raw sludge composites, for EP-Toxicity metals. The results are listed below, in ppm:

	<u>North Composite</u>	<u>South Composite</u>	<u>Detection Limit</u>
Ba	.35	.45	
Cd	ND	ND	.009
Cr	ND	.02	.015
Pb	ND	ND	.105
Hg	ND	ND	.0002
Ag	ND	ND	.021
As	ND	ND	.054
Se	ND	ND	.165

These analyses were done under Analytical Project No. 58-3536, at a cost of \$766.

L. W. Gyuricza, E-3
X5288

djc
DCL:WLG/sullivan
59-9105-01

Keywords:
EP-Toxicity
RS

R. F. Babcock, E-3
L. J. Duffy, E-3
J. G. Huddle, Chgo., MC1203
F. J. Piehl, F-5
E. C. Vaseleski, Chgo., MC4902

TEST RESULTS - RIVERFRONT

Indicator Parameters, Anions and Phenol - Wood River - June, 1985

Sample	TOC, mg/l	TOX, mg/l	Anions, mg/l			Phenol mg/l
			Fluoride	Chloride	Nitrate	
P-5	7, 8, 8, 8	0.01, ND, ND, ND	0.3	39	ND	ND
P-6S	14, 16, 13, 14	0.01, 0.01, 0.01, 0.01	0.2	38	ND	ND
RL-1	10, 10, 10, 10	0.01, 0.01, 0.01, 0.01	ND	26	ND	0.01
RL-1S	17, 16, 16, 17	0.03, 0.03, 0.03, 0.03	0.6	49	1	ND
RL-2	12, 12, 11, 12	ND, ND, ND, ND	0.4	18	1	ND
Detection Limit	1	0.01	0.2	1	1	0.01

ND = Not Detected

Metals in Wood River Groundwater - June, 1985 - mg/l

Sample	Hg	Zn	Mn	Cd	Cr	Fe	V	Cu	Ni	Na	Be	Ba	Tl	Sb	Ag	Pb	As	Se
P-5	ND	0.02	3.4	ND	0.07	2.6	ND	ND	ND	34	ND	0.074	ND	ND	ND	ND	0.026	ND
P-6S	ND	ND	3.8	ND	0.04	7.7	ND	ND	ND	32	ND	0.20	ND	ND	ND	ND	0.017	ND
RL-1	ND	ND	2.0	ND	0.04	5.8	ND	ND	ND	14	ND	0.30	ND	ND	ND	ND	0.040	ND
RL-1S	ND	0.03	0.039	ND	0.07	0.026	ND	ND	ND	46	ND	0.16	ND	ND	ND	0.003	0.021	ND
RL-2	ND	0.02	3.6	ND	0.06	4.4	ND	ND	ND	14	ND	0.17	ND	ND	ND	ND	0.043	ND
Detection Limit	0.0002	0.02	0.01	0.009	0.02	0.01	0.02	0.06	0.02	0.1	0.003	0.01	0.8	0.09	0.02	0.002	0.01	0.01

ND = Not Detected

GC/MS Volatile Trace Organics - Wood River Groundwater - June, 1985

<u>Sample</u>	<u>Priority Pollutants</u>	<u>Others</u>	<u>Estimated Conc., ug/l</u>
RL-1S	Methylene Chloride - 19 ug/l	None detected	
RL-2	Methylene Chloride - 48 ug/l	Cyclohexane	100-1000
		Methyl cyclopentane	100-1000
		Cyclohexene	10-100
		Dimethylbutane	10-100
		Dimethyl cyclobutene	100-1000
		Dimethyl cyclopentane	100-1000
		Methyl cyclohexane	100-1000
		Dimethyl cyclopentene	100-1000
		Trimethyl cyclopentane	100-1000
		Methyl cyclohexene	100-1000
		Dimethyl cyclohexane	200-2000
		C8 diolefins	100-1000
		Trimethyl cyclohexane	100-1000
		C9 olefins	20-200
		C10 olefins	30-300
		Methyl octane	10-100
		Methyl styrene	100-1000
		Methyl ethyl benzene	10-100

Detection Limit = 10 ug/l

Wood River, August 1985 - TOC, IOX, Anions, Phenol

<u>Sample</u>	<u>TOC, mg/l</u>	<u>IOX, mg/l</u>	<u>Anions, mg/l</u>			<u>Phenol mg/l</u>
			<u>Fluoride</u>	<u>Chloride</u>	<u>Nitrate</u>	
P-5	11, 11, 11, 12	0.08, 0.07, 0.07, 0.07	0.3	32	ND	ND
P-6S	50, 49, 51, 51	0.26, 0.59, 0.33, 0.18	0.7	69	ND	1.5
RL-1	6, 8, 9, 8	0.01, 0.02, 0.01, 0.01	0.2	19	ND	ND
RL-1S	22, 20, 21, 21	0.05, 0.05, 0.05, 0.06	0.5	50	ND	ND
RL-2	12, 13, 12, 13	0.01, 0.01, 0.02, ND	0.5	15	ND	ND
Detection Limit	1	0.01	0.2	1	1	0.01

ND = Not Detected

Metals in Hood River Groundwater - August, 1985 - mg/l

<u>Sample</u>	<u>Hg</u>	<u>Pb</u>	<u>Zn</u>	<u>Mn</u>	<u>Cd</u>	<u>Cr</u>	<u>Fe</u>	<u>V</u>	<u>Cu</u>	<u>Ni</u>	<u>Na</u>	<u>Be</u>	<u>Ba</u>	<u>Tl</u>	<u>Sb</u>	<u>Ag</u>	<u>Se</u>	<u>As</u>
P-5	ND	0.005	ND	3.2	ND	ND	ND	ND	ND	ND	36	ND	0.16	ND	ND	ND	ND	ND
P-6S	ND	ND	0.07	0.47	ND	ND	1.2	0.19	ND	0.13	1120	ND	0.21	ND	ND	ND	ND	0.038
RL-1	ND	ND	ND	2.7	ND	ND	ND	ND	ND	ND	18	ND	0.58	ND	ND	ND	ND	0.021
RL-1S	ND	ND	ND	0.080	ND	ND	ND	ND	ND	ND	54	ND	0.35	ND	ND	ND	ND	ND
RL-2	ND	ND	ND	3.9	ND	0.02	2.6	ND	ND	ND	16	ND	0.38	ND	ND	ND	ND	ND

Detection
Limit 0.0002 0.002 0.02 0.01 0.009 0.02 0.01 0.02 0.06 0.02 0.02 0.1 0.003 0.01 0.8 0.09 0.02 0.01 0.01

ND = Not Detected

Wood River Groundwater - August, 1985

GC/MS Analysis - Volatile Organics - ug/1			
Sample	Priority Pollutants	Other Organics	Estimated, Conc. ug/1
P-5	None Detected	1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon)	10-100
P-6S	Methyl Ethyl Ketone, 52 ug/1	Methyl Mercaptan	100-1000
		Acetone	100-1000
		t-butyl Alcohol	10-100
		Dimethyl disulfide	200-2000
		Methyl isopropyl disulfide	20-200
		Ethyl methyl disulfide	10-100
		C4 trisulfides	10-100
		Trimethylbicycloheptanone	10-100
		C4 benzene	10-100
RL-1	None Detected	Cyclohexane	10-100
		Methyl Cyclopentane	20-200
		Cyclohexene	10-100
		Methyl Cyclohexane	10-100
		C7 cyclic olefin	10-100
		Methyl Cyclohexene	10-100
		Dimethyl Cyclopentene	10-100
		Octadiene	10-100
		C8 cyclic olefin	20-200
RL-1S	None Detected	Acetone	100-1000
		Cyclohexane	10-100
		Cyclohexene	10-100
		C7 cyclic olefin	10-100
		Methyl styrene	10-100
RL-2	None Detected	Cyclohexane	10-100
		Methylcyclopentane	10-100
		Hexene	10-100
		C7 cyclic olefin	20-200
		Dimethyl Cyclohexane	10-100

Detection Limit = 10 ug/1

Wood River Groundwater - November, 1985 - TOC, TOX, Anions, Phenol

Sample	TOC, mg/l	TOX, mg/l	Anions, mg/l			Phenol mg/l	
			Fluoride	Chloride	Nitrate		Sulfate
P-5	5, 5, 5, 5	0.01, 0.01, 0.01, 0.01	ND	32	ND	198	ND
P-6S	218, 225, 230, 212	0.07, 0.06, 0.06, 0.07	ND	115	ND	2130	63
P-9S	51, 56, 53, 50	0.02, 0.02, 0.02, 0.02	ND	96	10	285	ND
P-12	83, 89, 87, 86	0.02, 0.02, 0.02, 0.03	ND	48	ND	27	0.13
P-12S	2860, 2820, 2860, 2840	0.62, 0.58, 0.61, 0.62	ND	4820	ND	285	166
RL-1	3, 3, 3, 3	ND, ND, ND, ND	ND	23	13	26	ND
RL-1S	11, 12, 12, 12	0.01, 0.01, ND, 0.01	ND	47	4	55	ND
RL-2	9, 9, 9, 9	ND, ND, ND, ND	ND	21	ND	1	0.02
Detection Limit	1	0.01	1	1	1	1	0.01

ND = Not Detected

Metals in Wood River Groundwater - November, 1985 - mg/l

<u>Sample</u>	<u>Zn</u>	<u>Mn</u>	<u>Cd</u>	<u>Cr</u>	<u>Fe</u>	<u>Ni</u>	<u>V</u>	<u>Cu</u>	<u>Na</u>	<u>Be</u>	<u>Ba</u>	<u>Sb</u>	<u>Ag</u>	<u>Pb</u>	<u>Tl</u>	<u>As</u>	<u>Se</u>	<u>Hg</u>
P-5	0.032	2.7	0.008	0.017	0.016	0.028	ND	0.016	32	ND	0.33	ND	ND	ND	ND	ND	ND	0.0004
P-6S	0.30	0.73	0.52	0.018	2.7	0.45	0.61	0.010	1440	ND	1.6	ND	0.014	0.011	ND	0.27	ND	0.0002
P-9S	0.012	9.9	0.009	0.021	16	0.084	0.012	ND	150	ND	0.71	ND	ND	ND	ND	0.092	ND	ND
P-12	0.084	3.3	ND	0.014	0.62	0.029	ND	ND	50	ND	0.76	ND	ND	0.014	ND	ND	ND	ND
P-12S	0.12	0.50	0.027	0.029	5.1	1.03	0.50	0.038	6130	0.003	1.6	ND	0.02	ND	ND	0.48	0.025	0.0003
RL-1	ND	2.0	ND	ND	0.69	ND	ND	ND	16	ND	0.0002							
RL-1S	ND	4.3	ND	ND	2.4	0.023	ND	ND	27	ND	0.64	ND	ND	ND	ND	0.018	ND	0.0004
RL-2	ND	3.1	ND	ND	20	ND	ND	ND	18	ND	ND	ND	ND	0.002	ND	0.015	ND	0.0012
Detection Limit	0.01	0.01	0.006	0.01	0.01	0.01	0.01	0.01	1	0.002	0.01	0.02	0.01	0.002	0.01	0.01	0.01	0.0002

ND = Not Detected

Wood River Groundwater - November, 1985

GC/MS Analysis - Volatile Organics - ug/1

<u>Sample</u>	<u>Priority Pollutants</u>	<u>Other Organics</u>	<u>Estimated, Conc. ug/1</u>
P-5	None Detected	None Detected	
P-6S	Methyl Ethyl Ketone, 10 ug/1	Acetone Dimethyl Disulfide	10-100 100-1000
P-9S	None Detected	Acetone Methyl t-butyl ether	10-100 10-100
P-12	Benzene, 14 ug/1 Toluene, 1300 ug/1 Methyl Ethyl Ketone, 140 ug/1	Acetone 1,1,2-Trichloro- 1,1,2-Trifluoroethane (Freon) Hexanone	100-1000 10-100 10-100
P-12S	Benzene, 38 ug/1 Methyl Ethyl Ketone, 34 ug/1	Acetonitrile Acetone 2-Propanol t-Butanol Methyl Ethyl Sulfide Dimethyl Disulfide Methyl t-Butyl Sulfide C3 Disulfide Dimethyl Trisulfide Diethyl Disulfide Trimethyl Bicycloheptanone Branched octanol Dodecene	10-100 100-1000 100-1000 10-100 10-100 1000-10,000 10-100 1000-10,000 1000-10,000 100-1000 10-100 20-200 10-100
RL-1	None Detected	None Detected	
RL-1S	o+p Xylene, 13 ug/1	Dimethylcyclopropane Cyclohexane Methyl cyclopentane Cyclohexene Methyl cyclopentene Hexenes Bicycloheptane C7 olefins Heptadiene Methyl styrene C8 diolefins	10-100 10-100 10-100 100-1000 100-1000 20-200 10-100 200-2000 100-1000 10-100 40-400
RL-2	None Detected	None Detected	

Detection Limit = 10 ug/1